

# The first period of labor

The **first period of labor** (or the *opening period*) begins with the **regular contractions of the uterine muscles**, which lead to the opening and closing of the cervix (this creates the *uterine gate*) and ends **disappearance of the uterine cervix** (it is no longer palpable).

The frequency of contractions initially does not exceed 1-2/10 min. In 10-15%, labor begins with the outflow of amniotic fluid (if not followed by uterine contractions within 1 hour, we speak of *premature outflow*.)

## Initiation of labor

hormones play a key role in the initiation of labor - the main ones are biochemical changes in the myometrium. During pregnancy, the myometrium is kept relaxed by a number of substances (relaxin, CRH (corticotropin-releasing h.), progesterone). During initiation, the reactivity of the myometrium to uterotonics begins to increase.

The myometrium begins to produce proteins - the so-called **CAP** (contraction-associated proteins) (they stimulate the formation of gap junctions between myocytes - accelerate the spread of depolarization, activate enzymes producing uterotonics (PG synthase ...), increase the number of uterotonic receptors).

The placenta begins to produce a higher amount of CRH before birth - it increases contractility, stimulates the synthesis of PG, stimulates the synthesis of cortisol in the fetus, progesterone during pregnancy maintains relaxation by inhibiting the formation of CAP, estrogen increases the number of gap-junctions and stimulates the degradation of collagen in cervix.

## Uterine activity

- The irritability of the myometrium is determined by the change of the resting potential of muscle cells to a critical potential.

In all three periods of labor, we can observe contractions and retractions:

- *contraction* - a reversible state, rhythmically repeating, resulting from contraction and subsequent relaxation;
- *retraction* - the relevant area is irreversibly reduced by permanent shortening and over-rotation of muscle cells.

## Description of contractions

- The basic value is **basal tone** (BT) - it expresses the amount of **intrauterine pressure**, at the beginning of the first period it is 8-12 mm Hg, it increases during labor to 12-18 mm Hg ( should not exceed 20 mm Hg);
- for contraction we describe these parts;
  - ascending part (stadium incrementi) - at the beginning of labor it is steeper, towards the end it is more gradual;
  - peak (acme);
  - descending part (stadium decrementi) - muscle repolarization;
- *intrauterine tensogram'* - we subtract the amplitudes... - see CTG;
- Montevideo units (MU) - recalculation from the sum of the amplitudes of contractions in a ten-minute interval (they should not exceed 300 for term birth);
- **external tocometry** is simpler - we mainly determine the frequency of contractions (4-5/10 min at the end of the 1st period);
- *resting phase* (length of the inter-contraction period) - should not be below 30 s;
- the entire birth is accompanied by approx. 110-150 contractions for primiparous women, 60-80 for multiparous women;
- the contraction wave propagates from the horns (the existence of certain pacemakers is assumed).

## Blood flow in the fetus during contractions

### Influence of placental flow

- intramyometrial pressure is reduced in the myometrium in the area of placenta attachment;
- a sufficient supply of oxidized blood is ensured by the different compressibility of veins and arteries;
- Under normal circumstances, the oxygen supply to the fetus is normal.

### Fluctuations intracranial pressure

- the head presses against the pelvic entrance and during contractions, **cervicocranial pressure** is applied there (it is created between the head and the barrier of the birth canal);
- the fetus reacts to a rise in intracranial pressure with bradycardia (there are early decelerations on the CTG);
- if the pressure exceeds the venous pressure - transient congestion occurs;
- if it exceeds the intra-arterial level - fetal CNS ischemia occurs!

## Throat and gate dilatation mechanism

- The muscle in the throat is practically circular;
- the course of the contraction wave causes, with each contraction, a concentrated pressure of the pressing part of the fetus on the lower uterine segment (contractiones ad partum);
- the lower uterine segment opens and allows the urgent part of the fetus to move there;
- as soon as the fetus leaves the upper part of the uterus, retraction occurs there (but it probably only occurs after the outflow of water);
- in the place of the pressure zone, stagnant edema develops on the head (birth tumor);
- Throat dilation occurs differently in primiparous women and multiparous mothers.

### **Throat and pharynx dilatation in primiparous women**

- They have a conical throat with a pitted outer gate;
- the throat opens cup-like from the inner gate (orificium cervicis uteri internum) to the outer gate;
- a mucus plug is pushed into the vagina;
- the average duration of the first stage of labor in first-time mothers is 6-7 hours.

### **Dilation in multiparous women**

- They have a cylindrical throat, the outer gate is yawning (circular fibers are broken by a previous birth);
- along with the dilation of the inner gate, the entire throat opens up as a whole;
- gradually moving the lower segment shortens;
- the average duration of the first stage of labor in women with multiple births is 3-4 hours.

## **Links**

### **Related articles**

- Birth
- The second period of labor
- The third period of labor

### **Used literature**

- BENEŠ, Jiří. *Studijní materiály* [online]. ©-. [cit. 2009]. <<http://jirben.wz.cz>>.